

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claim 1. (currently amended) A chemical treatment method by which ~~a metal film formed on a substrate is etched into a predetermined pattern~~ comprising:

(a) providing a material comprising a first metal film ~~coated~~ formed on a substrate and a second metal film formed on said first metal film, ~~said first metal film having a metal passivated layer on an exposed surface thereof~~[[,]] said first metal film being formed from a metal selected from the group consisting of chromium, titanium, tungsten, palladium and molybdenum, or an alloy thereof[[,]] ~~said second metal film having a predetermined pattern~~[[,]];

(b) forming a predetermined pattern on the second metal film to selectively remove the second metal film, an exposed portion of the first metal film from which the second metal film is removed being passivated to form a passivated portion;

[[(b)]] (c) immersing said material and a positive electrode in an acidic reduction treatment solution containing an acid radical[[,]] wherein ~~a portion of the first metal film on said material is dipped into the acidic reduction treatment solution[[,]] connecting the positive electrode and a metal portion of said material to an electrolytic circuit such that said material is a cathode and applying an electric current to the cathode and the positive electrode to carry out and performing an electrolysis[[,]] thereby producing reduction process by nascent hydrogen[[,]] whereby said nascent hydrogen reduces for the first metal film to reduce said metal passivated layer portion to said first metal film or an alloy thereof; and then~~

[[(c)]] (d) etching the first metal film by contacting [[an]] the exposed portion of said first metal or an alloy thereof with an acidic etching treatment solution to form the predetermined pattern on the first metal film.

Claim 2. (currently amended) A method according to claim 1, whereby in step [[(b)]] (c) , the acidic reduction treatment solution comprises a compound selected from the group

consisting of hydrochloric acid, sulfuric acid, carboxylic acid, hydrofluoric acid and phosphoric acid.

Claim 3. (canceled)

Claim 4. (previously presented) A method according to claim 1, wherein the acidic etching treatment solution contains a chloride ion.

Claim 5. (currently amended) A chemical treatment method ~~by which a metal film formed on a substrate is etched into a predetermined pattern~~ comprising:

(a) providing a material comprising a first metal film ~~coated~~ formed on a substrate and a second metal film formed on said first metal film, ~~said first metal film having a metal passivated layer on an exposed surface thereof~~[[,]] said first metal film being formed from a metal selected from the group consisting of chromium, titanium, tungsten, palladium and molybdenum, or an alloy thereof[[,]] ;

(b) forming a predetermined pattern on the second metal film to selectively remove the second metal film, an exposed portion of the first metal film from which the second metal film is removed being passivated to form a passivated portion;

[[(b)]] (c) immersing said material and a positive electrode in a reduction treatment solution containing a halogen ion[[,]] ~~wherein a portion of the first metal film on said material is dipped into the reduction treatment solution, connecting the positive electrode and a metal portion of said material to an electrolytic circuit such that said material is a cathode and applying an electric current to the cathode and the positive electrode to carry out~~ and performing an electrolysis[[,]] thereby producing reduction process by nascent hydrogen[[,]] whereby said nascent hydrogen reduces for the first metal film to reduce said metal passivated layer portion to said first metal film or an alloy thereof; and

[[(c)]] (d) dipping said material into an acidic etching treatment solution so that [[an]] the exposed

portion of ~~said first metal or an alloy thereof~~ is in contact with said acidic etching treatment solution to form ~~[[a]]~~ the predetermined pattern on the first metal film.

Claim 6. (currently amended) A method according to ~~claims~~ claim 1 ~~[[or 5]]~~, wherein the acidic etching treatment solution contains a halogen ion.

Claim 7. (previously presented) A method according to claim 6, wherein the halogen ion in the acidic etching treatment solution is a chloride ion.

Claim 8. (canceled)

Claim 9. (currently amended) A method according to ~~claims~~ claim 1 ~~[[or 5,]]~~ wherein the first metal film is ~~an alloy of~~ chromium.

Claim 10. (currently amended) A method according to ~~claims~~ claim 1 [[or 5,]] wherein the first metal film is an alloy of chromium.

Claims 11 to 24. (canceled)

Claim 25. (previously presented) A method according to claim 5, wherein the halogen ion in the reduction treatment solution is a chloride ion.

Claim 26. (canceled)

Claim 27. (currently amended) A method according to ~~claims~~ claim 1 [[or 5,]] wherein the first metal film comprises a nickel chromium alloy.

Claim 28. (canceled)

Claim 29. (canceled)

Claim 30. (withdrawn) A chemical treatment method by which a metal film formed on a substrate is etched into a predetermined pattern comprising:

(a) providing a material comprising a first metal film coated on a substrate and a second metal film formed on said first metal film, said first metal film having a metal passivated layer on an exposed surface thereof, said first metal film being formed from a metal selected from the group consisting of chromium, titanium, tungsten, palladium and molybdenum, or an alloy thereof, said second metal film having a predetermined pattern,

(b) immersing said material and a positive electrode in an alkaline reduction treatment solution containing a halogen ion, connecting the positive electrode and a metal portion of said material to an electrolytic circuit such that said material is a cathode and applying an electric current to the cathode and the positive electrode to carry out an electrolysis, thereby producing nascent hydrogen, whereby said nascent hydrogen reduces said metal

passivated layer to said first metal or an alloy thereof;
and then

(c) etching the first metal film by contacting an exposed portion of said first metal or an alloy thereof with an acidic etching treatment solution to form the predetermined pattern.

Claim 31. (withdrawn) A method according to claim 30, wherein in step (b), the alkaline reduction treatment solution which contains a halogen ion is selected from the group consisting of sodium chloride solution, potassium chloride solution and potassium iodide solution.

Claim 32. (withdrawn) A method according to claim 31, wherein the alkaline reduction treatment solution which contains a halogen ion is potassium chloride solution.

Claim 33. (withdrawn) A method according to claim 30, wherein the first metal film is chromium.

Claim 34. (withdrawn) A method according to claim 30, wherein the first metal film is an alloy of chromium.

Claim 35. (withdrawn) A method according to claim 30, wherein the first metal film comprises a nickel chromium alloy.

Claim 36. (currently amended) A method according to ~~claims~~ claim 1 [[or 5,]] wherein the passivated ~~layer~~ portion is an oxide layer.

Claim 37. (new) A method according to ~~claims~~ claim 1 [[or 5]], wherein the positive electrode is a plate.

Claim 38. (new) A method according to claim 5, wherein the acidic etching treatment solution contains a halogen ion.

Claim 39. (new) A method according to claim 38, wherein the halogen ion in the acidic etching treatment solution is a chloride ion.

Claim 40. (new) A method according to claim 5, wherein the first metal film is chromium.

Claim 41. (new) A method according to claim 5, wherein the first metal film is an alloy of chromium.

Claim 42. (new) A method according to claim 5, wherein the halogen ion in the reduction treatment solution is a chloride ion.

Claim 43. (new) A method according to claim 5, wherein the first metal film comprises a nickel chromium alloy.

Claim 44. (new) A method according to claim 5, wherein the passivated layer portion is an oxide layer.

Claim 45. (new) A method according to claim 5, wherein the positive electrode is a plate.